Amendments to the Claims:

Please cancel claims 1, 2, 7, 16, 23, 34-45, 47 and 51-57. Please amend claims 3, 5, 6, 8-14, 17-22, 24, 25, 27-31, 46 and 48-50, as indicated below. Following is a complete listing of the claims pending in the application, as amended:

1-2. (Cancelled)

3. (Currently amended) The apparatus of claim 8 ~~1~~ wherein the workpiece support is sized to support only a single microelectronic workpiece and the heat source is configured to contact no more than one microelectronic workpiece during a given processing cycle.

4. (Cancelled)

5. (Currently amended) The apparatus of claim 8~~1~~, further comprising a purge fluid channel having an inlet coupleable to a source of purge fluid and an outlet proximate to the workpiece support, the purge fluid channel being positioned to conduct the purge fluid from the source of purge fluid to a region adjacent to the microelectronic workpiece when the microelectronic workpiece is supported by the workpiece support.

6. (Currently amended) The apparatus of claim 8 ~~1~~ wherein the heat source includes an electrical resistance heater.

7. (Cancelled)

8. (Currently amended) ~~The apparatus of claim 1, further comprising~~ An apparatus for thermally processing a microelectronic workpiece, comprising:

a workpiece support positioned to engage and support the microelectronic workpiece;

a heat source having a solid engaging surface positioned to engage a surface of the microelectronic workpiece, the heat source having a plurality of vacuum aperture portions coupleable to a vacuum source, with the solid engaging surface being generally continuous between the vacuum aperture portions, the heat source further having a heat generator attached directly to and/or integral with the heat source, at least one of the heat source and the workpiece support being movable relative to the other between a first position with the microelectronic workpiece contacting the engaging surface of the heat source and a second position with the microelectronic workpiece spaced apart from the engaging surface, the heat source being sized to transfer heat to the microelectronic workpiece at least sufficient to thermally process a selected material of the microelectronic workpiece when the microelectronic workpiece is engaged with the heat source in the first position; and

first and second heat sinks with the second heat sink spaced apart from the heat source and coupled to a supply of cooling fluid, the second heat sink further having an engaging surface with vacuum apertures coupled to a vacuum source and the first heat sink positioned between the second heat sink and the heat source, the first heat sink being movable relative to the second heat sink between a first position and a second position, the first heat sink being engaged with the engaging surface of the second heat sink to cover the vacuum apertures and cool the first heat sink when the first heat sink is in the first position, the first heat sink being engaged with the heat source to cool the heat source and the microelectronic workpiece when the microelectronic workpiece is engaged with the heat source and the first heat sink is in the second position.

9. (Currently amended) The apparatus of claim 8 ~~1~~ wherein the heat source has an electrical resistance element with a contact portion, and wherein the apparatus further comprises an electrically and thermally conductive connector having a first end

and a second end opposite the first end, the connector being engaged with the contact portion of the electrical resistance element toward the first end of the connector, the connector being coupleable to a source of electrical current toward the second end of the connector, a cross-sectional area distribution of the connector between the first and second ends and transverse to a flow of electrical current through the connector being sized to generate electrical resistance heating at least equal to a loss of heat through the connector by thermal conduction.

10. (Currently amended) The apparatus of claim 8 ~~1~~ wherein the heat source has a first region configured to transfer heat to the microelectronic workpiece a first rate per unit area of the microelectronic workpiece, the heat source further having a second region configured to transfer heat to the microelectronic workpiece at a second rate per unit area of the microelectronic workpiece, the second rate per unit area being greater than the first rate per unit area.

11. (Currently amended) The apparatus of claim 8~~1~~, further comprising the microelectronic workpiece.

12. (Currently amended) The apparatus of claim 8 ~~1~~ wherein the heat source is sized to transfer heat to the microelectronic workpiece at a rate sufficient to anneal the selected material of the microelectronic workpiece.

13. (Currently amended) The apparatus of claim 8 ~~1~~ wherein the selected material includes solder and wherein the heat source is sized to transfer heat to the microelectronic workpiece at a rate sufficient to reflow the solder.

14. (Currently amended) The apparatus of claim 8 ~~1~~ wherein the selected material includes photoresist and wherein the heat source is sized to transfer heat to the microelectronic workpiece at a rate sufficient to cure and/or bake the photoresist.

15-16. (Cancelled)

17. (Currently amended) The apparatus of claim 22 ~~16~~ wherein the first workpiece support is movable relative to the first heat source between a first position and a second position, and further wherein the first heat source includes a solid engaging surface engaged with the first microelectronic workpiece when the workpiece support is in the first position, the solid engaging surface being spaced apart from the first microelectronic workpiece when the workpiece support is in the second position, and wherein the apparatus further comprises a heat sink beneath the heat source.

18. (Currently amended) The apparatus of claim 22 ~~16~~ wherein the first chamber includes a purge gas channel positioned to supply purge gas to the second chamber.

19. (Currently amended) The apparatus of claim 22 ~~16~~ wherein the first chamber and the second chamber are modular and interchangeable.

20. (Currently amended) The apparatus of claim 22 ~~16~~ wherein the first chamber includes a first lid movable between an open position to receive the first microelectronic workpiece and a closed position to at least partially enclose the first microelectronic workpiece, and further wherein the second chamber includes a second lid movable between an open position to receive the second microelectronic workpiece and a closed position to at least partially enclose the second microelectronic workpiece, and wherein the apparatus further comprises a base member supporting the first heat source, with the second lid interengaged with and depending from the base member.

21. (Currently amended) The apparatus of claim 22 ~~16~~ wherein the first workpiece support is sized to support no more than one microelectronic workpiece at a time and the first heat source is sized to contact no more than one microelectronic workpiece at a time.

22. (Currently amended) ~~The apparatus of claim 16, further comprising~~ An apparatus for thermally processing at least first and second microelectronic workpieces, comprising:

a first thermal processing chamber having a first workpiece support positioned to engage and support the first microelectronic workpiece, the first chamber further having a first heat source sized to transfer to the first microelectronic workpiece heat sufficient to thermally process the first microelectronic workpiece when the first microelectronic workpiece is at least proximate to the first heat source;

a second thermal processing chamber proximate to the first chamber and having a second workpiece support positioned to engage and support the second microelectronic workpiece, the second chamber further having a second heat source sized to transfer to the second microelectronic workpiece heat sufficient to thermally process the second microelectronic workpiece when the second microelectronic workpiece is at least proximate to the second heat source, and with the first chamber positioned above the second chamber such that a portion of the first chamber between the first and second chambers is common to the second chamber and defines a lower portion of the first chamber and an upper portion of the second chamber; and

first and second heat sinks with the second heat sink spaced apart from the first heat source and coupled to a supply of cooling fluid and the first heat sink positioned between the second heat sink and the first heat source, the first heat sink being movable relative to the second heat sink between a first position with the first heat sink engaged with the second heat sink to cool the first heat sink, and a second position with the first heat sink engaged with the first heat source to cool the heat source and the first microelectronic workpiece when the first microelectronic workpiece is engaged with the first workpiece support.

23. (Cancelled)

24. (Currently amended) The apparatus of claim 27 ~~23~~ wherein the workpiece support is movable relative to the heat source between a first position with the microelectronic workpiece contacting the heat source and a second position with the microelectronic workpiece spaced apart from the heat source.

25. (Currently amended) The apparatus of claim 27 ~~23~~ wherein the first heat sink includes a passive conduction heat sink having no cooling fluid links coupled thereto.

26. (Cancelled)

27. (Currently amended) ~~The apparatus of claim 23~~ An apparatus for thermal processing a microelectronic workpiece, comprising:

an apparatus support;

a heat source supported by the apparatus support;

a workpiece support positioned proximate to the heat source to engage and support the microelectronic workpiece relative to the heat source;

a heat sink proximate to the heat source and positioned to selectively transfer heat from the heat source to cool the heat source and the microelectronic workpiece, at least one of the heat sink and the heat source being movable relative to the other between a disengaged position and an engaged position, the heat sink having an engaging surface that is compressible between an uncompressed configuration when the heat sink is disengaged from the heat source and a compressed configuration when the heat sink is engaged with the heat source; and

wherein the heat sink is a first heat sink and the engaged position is a first engaged position, and wherein the apparatus further comprises a second heat sink spaced apart from the first heat sink and coupled to a supply of

cooling fluid, and wherein the first heat sink is positioned between the second heat sink and the heat source, the first heat sink being movable relative to the second heat sink between the first engaged position with the first heat sink engaged with the heat source and a second engaged position with the first heat sink engaged with the second heat sink to cool the first heat sink.

28. (Currently amended) The apparatus of claim 27 ~~23~~ wherein a thermal mass of the first heat sink exceeds a thermal mass of the heat source.

29. (Currently amended) The apparatus of claim 27 ~~23~~ wherein a thermal capacity of the first heat sink exceeds a thermal capacity of the heat source.

30. (Currently amended) The apparatus of claim 27 ~~23~~ wherein the workpiece support is sized to support no more than one microelectronic workpiece at a time and the heat source is sized to contact no more than one microelectronic workpiece at a time.

31. (Currently amended) The apparatus of claim 27 ~~23~~ wherein the heat source includes a vacuum aperture coupleable to a vacuum source and facing the microelectronic workpiece when the microelectronic workpiece is engaged with the workpiece support to draw the microelectronic workpiece toward the heat source.

32-45. (Cancelled)

46. (Currently amended) The apparatus of claim 8 ~~40~~ wherein the heat source has an outer edge and an inner region inward of the outer edge and further wherein a power generated by the heat source per unit area of the microelectronic substrate increases gradually in a radial direction inwardly from the outer edge over at least a portion of the heat source.

47. (Cancelled)

48. (Currently amended) The apparatus of claim 8 ~~40~~ wherein the heat source is generally circular and includes an elongated electrical resistance heater having a generally constant cross-sectional area, and wherein at least a portion of the heater is doubled back on itself to extend along a plurality of spaced apart circumferential lines in both the first region and the second region, circumferential lines in the first region being spaced apart from each other by a first distance, circumferential lines in the second region being spaced apart by a second distance less than the first distance.

49. (Currently amended) The apparatus of claim 8 ~~40~~ wherein the heat source includes a substrate having a substrate surface area and an electrical resistance heater adjacent to the substrate and having a heater resistance surface area, the resistance heater surface area being approximately 67% of the substrate surface area.

50. (Currently amended) The apparatus of claim 8 ~~40~~ wherein the heat source includes a first electrical resistance heater in the first region coupled to a first controller and a second electrical resistance heater in the second region coupled to a second controller, the first and second controllers being independently controllable to provide power to ~~the~~ a first region independent of power provided to ~~the~~ a second region.

51-101. (Cancelled)